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THE CORRECT IDENTITY OF THE PELAGIC AMPHIPOD *PRIMNO MACROPA*, WITH A DIAGNOSIS OF *PRIMNO ABYSSALIS* (HYPERIIDEA: PHROSINIDAE)

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Abstract.—Two large species of *Primno* are recognized: *P. macropa* Guérin-Méneville, an inhabitant of the Subantarctic biotic province, and *P. abyssalis* (Bowman), a resident of the Subarctic biotic province. *Primno macropa* is redescribed, and records from USNS *Eltanin* cruises mapped. It is suggested that *P. macropa* expanded its range into the North Pacific during a period of cooling. The North Pacific population became isolated when warming occurred and evolved into a distinct species, *P. abyssalis*.

In my revision of *Primno* (Bowman 1978) I identified as the type-species, *P. macropa* Guérin-Méneville, a large form that appeared to be confined to Subarctic water in the North Pacific. I made this identification with some misgivings, since the type-locality was "les mers du Chile." But I did so because the North Pacific form was the only one available to me that matched Guérin-Méneville's species in body length and in the form of pereopod 5. I had been unsuccessful in my attempts to obtain large specimens of *Primno* from the Southern Hemisphere. Recently, however, I received from Brain P. Boden specimens of a large form of *Primno* from the vicinity of Marion Island in the southern Indian Ocean. This form is very similar to the North Pacific form, but differs consistently in several details. I consider the two forms to be specifically distinct, and the Marion Island form to represent the true *Primno macropa*. Additional material of the true *P. macropa* has been identified in collections made during cruises of the USNS *Eltanin* for the U.S. Antarctic Research Program. Figure 2 shows the locations of these records. The North Pacific species identified as *Primno macropa* by Bowman (1978) is herein referred to *Primno abyssalis* (Bowman, in Fulton 1968).

Primno abyssalis (Bowman, 1968)
Fig. 1A–K

Euprimno abyssalis Bowman, 1953:348–354, figs. 45–46, charts 114–116 [unpublished].—Bowman, in Fulton, 1968:104, 109.

Primno macropa Guérin-Méneville.—Thorsteinson, 1941:93–94, figs. 98–102.—Vinogradov, 1956:209.—Yoo, 1971a:59 [partim]; 1971b, passim; 1972a, passim; 1972b:174.—Sanger, 1973:20, 1974:7.—Lorz and Pearcy, 1975:1445–1446.—Bowman, 1978:3–8, figs. 1–2, 3a–c, 4.—Brusca 1981:43, fig. 15b.—Semenova, 1982:354–355 [partim], fig. 189.

Euprimno macropus (Guérin-Méneville).—Wailes, 1929:161; 1931:41; 1933:9.—Behning, 1939:363.

Types.—Holotype, adult ♀, 14 mm in length, Scripps Institution of Oceanography *Northern Holiday* expedition sta 12, 10 Aug 1951, 40°34′N, 147°54.5′W,

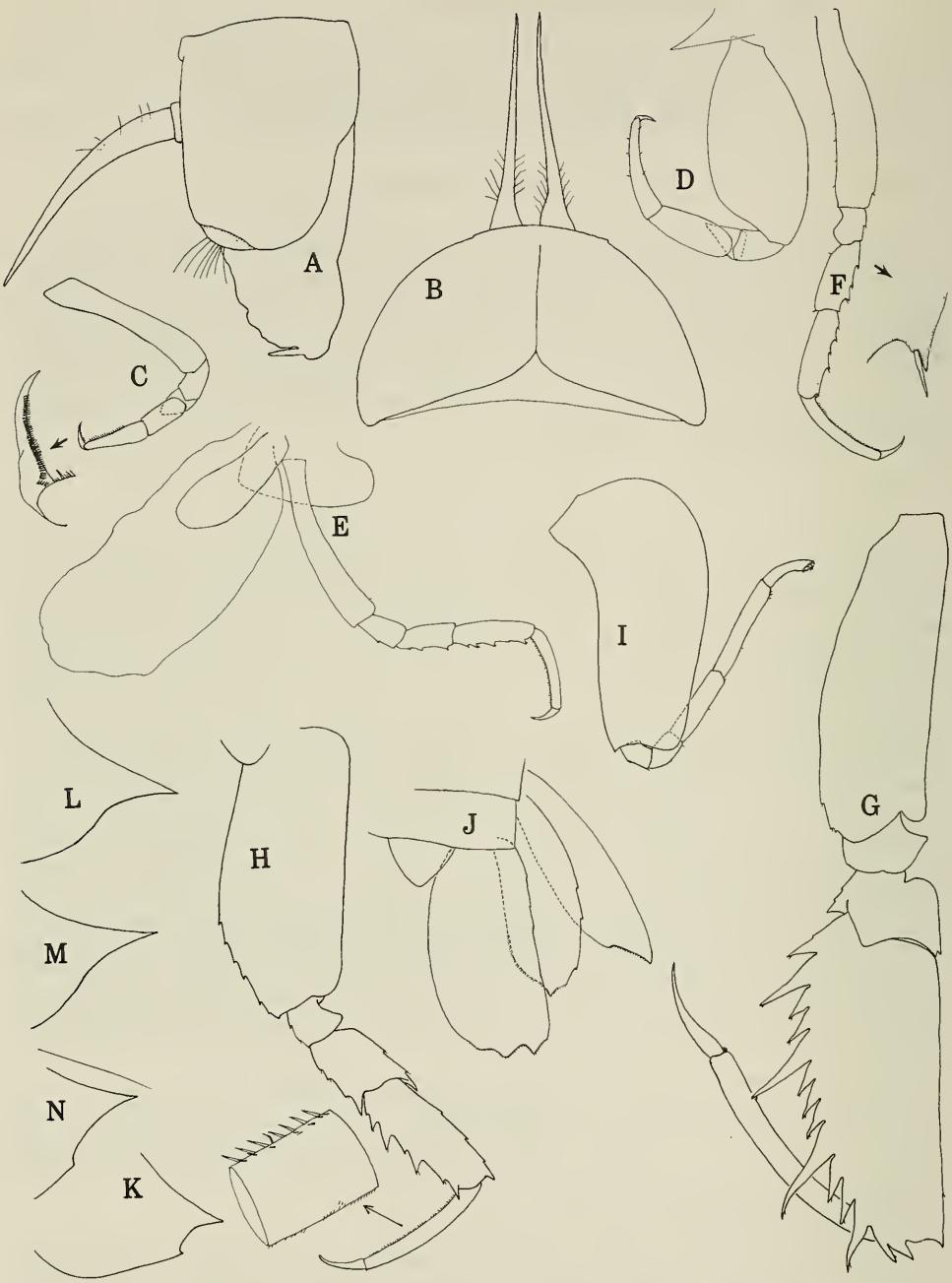

Fig. 1. A–K, *Primno abyssalis* ♀: A, Head, lateral; B, Head, dorsal; C–I, Pereopods 1–7; J, Telson and uropods; K, Posteroventral corner of pleonite 3. L–N, *Primno macropa*: Posteroventral corners of pleonite 3 of three different females.

Isaacs-Kidd midwater trawl, 1020-0 m, USNM 213613. Paratypes, 2 ♀, 14 mm in length, from same sample, deposited in collections of Scripps Institution of Oceanography.

Etymology.—From the Latin "abyssus" (bottomless depth) + the adjectival suffix "-alis," referring to the bathypelagic distribution of the species.

Diagnosis (emended from Bowman 1978).—Length up to 21 mm. Rostrum truncate, limited to space between antennae 1. Middorsal spines more pronounced than in other species of *Primno*. Pleonite 3 with shallow concavity ventral to posteroventral spine, with or without low defining notch. Antenna 1 only slightly longer than head. Rudimentary ♀ antenna 2 with few inconspicuous setae. Pereopod 5 carpus with proximal 1–2 teeth short; long teeth slightly shorter than width of carpus. Pereopod 6 basis slightly more than ⅓ as wide as long, narrowed proximally, proximal part of anterior margin concave; ischium, merus and carpus narrower than in other species of *Primno*; merus about ⅔ length of carpus. Pereopod 7 basis about as long as remaining segments combined. Uropod 3 with well developed medial shoulder.

Distribution.—Subarctic biotic province, North Pacific.

Primno macropa Guérin-Méneville
Fig. 1L–N

Primno macropa Guérin-Méneville, 1836:4, pl. 17, fig. 1a–f.—Bovallius, 1887: 28.—?Spandl, 1927:168–169.—Barnard, 1930:424–425 [partim]; 1932:287–288 [partim].—Mackintosh, 1934, passim.—Hardy and Gunther, 1935, passim.—Hurley, 1955:172–174, figs. 219–235; 1969:33, map 7.—Vinogradov, 1962: 22.—Semenova, 1982:354–355 [partim].

Primno menevillei Stebbing, 1888:1447–1448, pl. 179B.

Primno antarctica Stebbing, 1888:1448–1451, pl. 209B.

Euprimno macropus (Guérin-Méneville).—Bovallius, 1889:400–407 [partim].—Walker, 1907:9.

Euprimno macropa Guérin-Méneville var. *menevillei* Stebbing.—Monod, 1926: 50–51, fig. 49.

Material.—Near Marion Island, Prince Edward Islands: Sta 6, no. 133, 46°52′S, 37°54′E, 100–0 m, 5 May 1983, 1 ♀; Sta 11d, 44°42′S, 22°30′W, 1000–500 m, 21 May 1983, 4 ♀; Sta 18, no. 41, 46°38′S, 38°05E, 100–0 m, 24 May 1983, 1 ♀. From collections of USNS *Eltanin* in the Southern Ocean: localities shown in Fig. 2 (complete station data available upon request).

Diagnosis.—Similar to *Primno abyssalis* but with the following differences: Body shorter, up to about 15 mm in length. Rostrum broad-truncate, conforming to contour of head, about 0.4 width of head. Middorsal spines slightly less well developed. Pleonite 3 with deeper concavity ventral to posteroventral spine, defined by a tooth. ♀ antenna 1 about ⅛ longer than head. Rudimentary ♀ antenna 2 with well developed cluster of delicate setae. Pereopod 6 not so slender; anterior margin of basis convex throughout length; merus about half length of carpus; posterior margin of propus with minute setae.

Distribution.—Subantarctic biotic province.

Relationships.—*Primno macropa* and *P. abyssalis* differ from the other species of *Primno* in their large size and in the pattern of teeth on the pereopod 5 carpus.

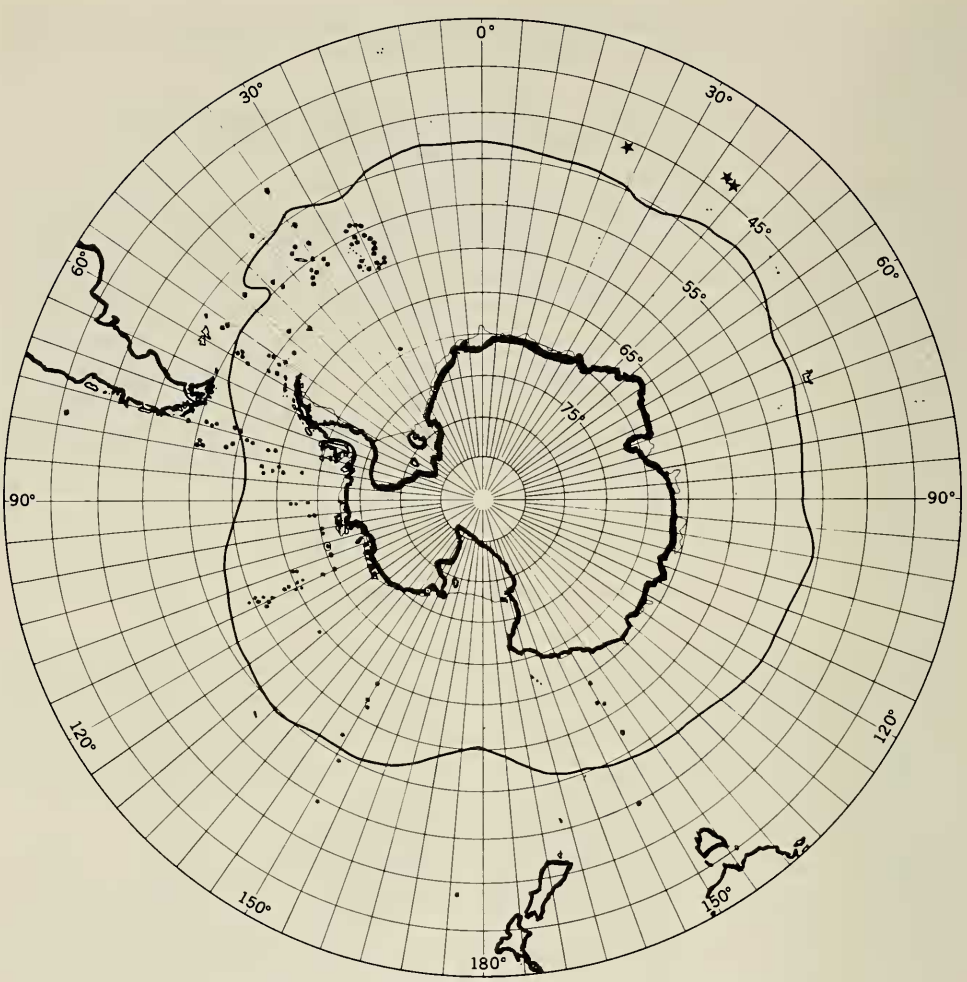

Fig. 2. Records of *Primno macropa* from cruises of USNS *Eltanin* (dots) and from Marion Island stations (stars).

They also live at greater depths and in higher latitudes than the other species. I suggest that *P. macropa* is the older of the two large species and gave rise to *P. abyssalis* as follows:

Originally *P. macropa* or its progenitor was limited to the Southern Hemisphere and there was no large *Primno* in the North Pacific. Cooling of the oceans by a few degrees during an ice age permitted *P. macropa* to expand its range into the North Pacific by way of the western coasts of South and North America. When the oceans warmed again the continuity was broken, leaving the North Pacific population isolated from that of the Southern Hemisphere. Since this isolation, the populations developed the small but constant differences that now require their recognition as distinct species. A number of species of zooplankton and nekton have a distribution pattern like that of *P. macropa-abyssalis* combined, occupying what McGowan (1974) calls the Subarctic and Subantarctic biotic province.

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